WHAT IS CLAIMED IS:

1. A process for thermal sterilization of ventilated air of a site requiring a low level of microorganism contamination, characterized in that the air to be sterilized is moved by forced circulation in a cycling operation with flows alternatively in opposite directions, for example by use of an air circulator (1) and feed valves (3) , and across a thermal sterilization chamber (12) containing an electrical resistor (7) positioned between two stacks of metallic grilles (8,9) perpendicularly to the grilles of these stacks.

2. A process according to claim 1, characterized in that a dissipation of the kinetic energy of the air flow is achieved by transit through empty zones or plenums (5,6) located at the inlet and the outlet of the thermal sterilization chamber (8-7-9).

3. A process according to claim 1 or 2, characterized in that the frequency of inversion of the air flow direction is greater than one inversion per minute.

4. A process according to any one of claims 1 to 3, characterized in that a cycle is constituted of two half-cycles, preferably of equal duration, and characterized in that the air untreated at the end of each half-cycle is recycled to the air circulator inlet (1).

5. A process according to any one of claims 2 to 4, characterized in that air circulator (1) is disposed in such a manner as to displace the inlet ambient air during the first half cycle, across one of the feed valves (3), then an empty zone (5) or plenum, then in one of the two stacks of metallic grilles (8), then in a heating zone (7), then in the second stack of metallic grilles (9), then in the second plenum (6), then in the other feed valve (3), then, finally, to the site to be ventilated or across a purge valve; the air follows an inverse path after the inversion of the feed valves (3), during the full duration of the second half-cycle.

6. An apparatus for thermal sterilization of air ventilating a site that requires a low level of microorganism contamination, comprising a thermal sterilization chamber (12) and means for forcing circulation of the air across the chamber, which means comprise for example , a centrifugal air circulator (1), and feed valves (3) characterized in that the thermal sterilization chamber contains an electrical resistor (7) positioned between two stacks of metallic grilles (8,9), and in that said means for forced circulation of the air across the thermal sterilization chamber comprise a cyclic programming system, solenoid valves (3) and an air circuit that permits forcing the direction of the air flow produced, alternatively, into one side or the other of the chamber, perpendicularly to the metallic grilles of the stacks (8,9).

7. An apparatus according to claim 6, characterized in that the air circuit comprises two empty zones or plenums (5,6) located on the inlet/outlet sides (11) of the thermal sterilization chamber (8-7-9).

8. An apparatus according to claim 7, characterized in that the plenums (5,6) located on the inlet/outlet sides (11) of the thermal sterilization chamber (12) have a volume greater than or equal to the volume of the stacks (8,9).

9. An apparatus according to any one of claims 6 to 8, characterized in that the face of the stacks located between the stack and the plenum is equipped with a perforated plate (11) presenting multiple apertures of different diameters.

10. An apparatus according to any one of claims 6 to 9, characterized in that the metallic grilles are obtained from continuous metallic grilles made from wires of a diameter comprising between 0.1 mm and 1 mm.

11. Apparatus according to any one of claims 6 to 9, characterized in that the metallic grilles (8,9) are replaced by screens made of expanded metal.

12. Apparatus according to any one of claims 6 to 11, characterized in that the metallic grilles or screens (8,9) have a volumetric porosity that is between 75% and 95%.

13. An apparatus according to any one of claims 6 to 12, characterized in that the metallic grilles or screens constituting the stacks (8,9) are made from a metal of very high thermal conductivity, for example in aluminum, or copper, or galvanized steel.

14. An apparatus according to any one of claims 6 to 13, characterized in that each stack (8,9) has a high thermal conductivity in a cross-section perpendicular to the direction of flow and negligible in the direction of the flow.

15. An apparatus according to any one of claims 6 to 14, characterized in that the electrical resistor (7) is located in between the two stacks and that it has been designed to offer a large heat exchange surface in any part of the square or rectangular cross-section of the chamber (12).

16. An apparatus according to any one of claims 6 to 15, characterized in that it comprises purge valves (4) that allow recycling of the untreated air to the air circulator inlet at the end of each half-cycle.

17. An apparatus according to any one of claims 6 to 16, characterized in that the section of the sterilization chamber (12) is square or rectangular and the valves are constituted of flaps having a length identical to the length of the longest side of the section.